CONCEPT DRAFT

Draft date 05/11/16

To TAC Reviewers: These blue boxes will be used throughout the Concept Framework to provide you with additional information, context, ongoing debates on the ideas described in that section. This information may end up in the Framework, may get deleted, or may be housed in a supporting report in order to keep the Framework simple.

Lower Boise River Water Quality Trading Watershed Framework

Idaho Department of Environmental Quality

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Table of Contents

1. Introduction

The purpose of this document is to provide the updated Idaho Department of Environmental Quality (DEQ) framework for the implementation of water quality trading within the Lower Boise River. This framework supplants the 2010 Lower Boise Trading Framework (DEQ, 2010a).

A "trade" occurs when water quality credits are acquired and used to satisfy a regulatory requirement, such as the water quality based effluent limit (WQBEL) in an NPDES permit. "Credits" are the measured or estimated pollution REDUCTION generated by a trading project, and may include adjustments for trading baseline (Section 3.3), trade ratios (Section 5), or others.

An "offset" as defined in IDAPA 58.01.02.06(c) is a reduction in pollution from other sources that are tied to a proposed activity or discharge, must be upstream and must occur before the proposed discharge. Offsets are activities or actions taken by discharger outside of a formalized trading plan. While offsets are outside the scope of this framework, standards and requirements such as monitoring and design standards should be consistent with the Lower Boise Total Phosphorus TMDL Implementation plan and requirements set by Idaho Department of Environmental Quality (DEQ).

This Framework describes the specific conditions under which credits may be generated and how trades may occur in the Lower Boise River Watershed. Trades are enforceable only when incorporated directly into a "trading plan" that is reviewed and approved by DEQ and U.S. EPA as part of an agency approved permit, license, or order.

This framework update is supported by technical information derived from the Lower Boise River Total Phosphorus TMDL addendum and feedback from the Boise Watershed Advisory Group's Technical Advisory Committee (TAC). The Framework has been designed to incorporate concepts from the Regional Recommendations for the Pacific Northwest on Water Quality Trading (also referred to as the Joint Regional Recommendations). This framework also incorporates recent technical work completed by Willamette Partnership (WP, 2015), The Freshwater Trust (TFT, 2015), Idaho Department of Environmental Quality (IDEQ 2016).

Water quality trading, as outlined in this document is one of multiple strategies identified to achieve load reductions set forth in the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015). The components of this water quality trading framework will be part of a broader suite of strategies under development in the Boise River (Lower) Subbasin TMDL Implementation Plan.

1.1. Authority for Water Quality Trading in the Lower Boise

Water quality trading (also called pollutant trading) is recognized in Idaho's Water Quality Standards at IDAPA 58.01.02.055.06, and was identified in the Lower Boise River Total Phosphorus TMDL addendum as a means to achieve pollution reduction (DEQ, 2015). Trades must be implemented consistent with the federal Clean Water Act (CWA), statewide Water Quality Trading Guidance (DEQ, 2010a, to be updated in 2016), Lower Boise River TMDLs, and this updated Lower Boise River Water Quality Trading Framework (Framework).

1.2. Watershed Context

The Lower Boise River Watershed (ID 17050114) drains approximately 1,290 square miles of rangeland, forests, agricultural lands and urban areas from below Lucky Peak Dam into the Snake River at the confluence between the cities of Adrian and Nyssa, Oregon[1]. The watershed includes impaired waters for seven pollutants with TMDLs for sediment, bacteria, and phosphorus[2]. Pollutants impact cold water aquatic life, salmonid spawning, domestic and agricultural water supply, primary and secondary contact recreation.

Water quality trading is intended to work in concert with existing ongoing efforts to enhance the Lower Boise River and watershed. In addition to TP reductions expected from point source facility upgrades and reductions associated with nonpoint-to-point source trading, DEQ has identified several TP load reduction strategies within the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015), including:

- TP reductions from stormwater dischargers through project types, increased attention to on-site stormwater inspection, and public education.
- Mitigatation/elimination nonstormwater (dry weather) discharges, and steps to within the implementation timeframe.
- Voluntary BMP implementation on agricultural lands, contingent on available funding, cost sharing, willing partners (e.g., NRCS Farm Bill, 319 grant program).
- Permitting of new septic systems and promoting the use of new technology for existing septic systems.

[1] For additional context information on the Lower Boise River Watershed, please refer to the Lower Boise River Total Phosphorus addendum (DEQ, 2015)

[2] IDEQ (2012) Idaho's Integrated Report pg.20-25. http://www.deq.idaho.gov/media/1117323/integrated-report-2012-final-entire.pdf.

- Offset credits for reducing nonpoint source loads (i.e., sewering of septic systems).
- Growth and development (i.e., paving new road surfaces).

1.3. Framework Objectives

This Framework seeks to:

- Help implement the water quality goals described in the Lower Boise River TMDLs;
- Provide cost effective compliance options for wastewater and stormwater permittees; and
- Create voluntary incentives for projects that address non-point source pollution;

The water quality objectives of this watershed trading Framework are tied to the following total phosphorus TMDL addendum targets and allocations (DEQ, 2015), shown in Table 1.3.

Table 1.3. Water quality goals and targets for this Framework

Goal	Target	TP TMDL Allocations	Source
Reduce Total Phosphorus (TP) loads to achieve the 2004 Snake River-Hells Canyon TMDL TP target from May 1 – September 30	TP concentrations (and TP load equivalents) < 0.07 mg/L in the Lower Boise River near Parma.	• Point sources at 0.1 mg/L TP May–September • Point sources at 0.35 mg/L TP October–April (except Idaho Dep't of Fish & Game Eagle and Nampa facilities, which are set at 0.1 mg/L year-round) • Agricultural tributaries and ground water at 0.07 mg/L TP year-round • Stormwater (wet weather) TP loads reduced by 42% • Non stormwater (dry weather) TP loads reduced by 84%	Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015)
Reduce Chlorophyll-*a* within the Middleton-to-Indian Creek and Indian Creek-to-mouth of the Lower Boise River assessment units	Achieve mean monthly benthic (periphyton) chlorophyll-*a* target of < 150 mg/m^2.		Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015)

1.4. Guiding Principles for Water Quality Trading

Some information in this Framework is repetitive of the draft state trading guidance, under development by DEQ. We chose to repeat the information since the state guidance is not yet available and may change through internal review and public comment processes.

Trades under this Framework are designed to be consistent with the following principles:

- Trading should create a net environmental benefit[3];
- Trades should be based in ~~sound~~ science and more effectively accomplish regulatory and environmental goals than other alternatives;
- Regulators must be able to confirm the promised water quality improvements are actually delivered;
- The benefits of trading must be delivered so it does not result in localized exceedance of water quality standards;[4]
- Trades must be consistent with Idaho water quality standards, NPDES permits, the CWA and its implementing regulations, and local laws; and
- Trades cannot circumvent existing U.S. EPA approved technology-based effluent limits (TBELs).

TAC Reviewers: Net environmental benefit can be broadly defined as additional gains in water quality or other ecological functions resulting from trades. The footnote from the principles above added to provide the reader more context for how environmental benefit is defined.

3 Meeting net environmental benefit can be done by: A) using positive trading ratios specific to environmental gain, B) applying conservative estimates in credit quantification C) how baseline criteria are set, D) project types that provide other environmental benefits (e.g., habitat), E) or other justifications. As a guiding principle, both the state guidance and this framework have not defined net environmental benefit specifically. However, the principle of net environmental benefit carries throughout the document in the various elements, including meeting baseline requirements, trading ratios and quantification from credit generating projects.

[4] For the purposes of trading, a *localized impact* occurs if the continued discharge from the purchasing source would impact existing and designated uses in the area immediately surrounding the discharge.

1.5. Public involvement

This Framework builds heavily from the concepts included in the 2010 Lower Boise River Water Quality Trading Framework (DEQ, 2010a), which was developed through extensive engagement of local stakeholders (Ross & Associates, 2000).

The update of concepts included in this Framework were made through recommendations provided by a Technical Advisory Committee (TAC) of the Lower Boise River Watershed Advisory Group (WAG). TAC participants included members of the WAG, watershed stakeholders, Idaho Department of Environmental Quality (DEQ) and the Environmental Protection Agency (EPA). Through a series of work sessions the TAC developed and made recommended changes to the WAG for review and approval. Once approved, these recommendations were submitted to DEQ for approval. ~~INSERT RESULT OF WAG TECHNICAL ADVISORY COMMITTEE (E.G., WAG RECOMMENDATION)~~. In addition to the WAG process, DEQ provided a public review period for members of the public to review and comment on the Framework.

The public will also have an opportunity to review trading details for permittees during the public review of NPDES permits (40 CFR §124.10; DEQ, 2010b) or 401 certifications (DEQ, 2010b). In addition, when new or substantially revised project type quality standards are proposed, DEQ will convene a technical review process to vet those standards, as described in Section 10.1 of this Framework.

2. General Provisions for Water Quality Trading

2.1. Trading Parties and Types of Trades

Both point and nonpoint sources are eligible to generate and sell credits. Credits can be purchased to meet compliance obligations or for voluntary reasons (e.g., industry stewardship goals).

Incorporating Trading into Regulatory Documents

Trading must be implemented through an enforceable, DEQ-approved mechanism, typically a permit, order, or license. This Framework explicitly supports potential trades for the following permit types and sectors (other permit types and sectors will be considered on a case-by-case basis):

Table 2.1. Eligible buyers and sellers under this Framework

Buyer/permit type	National Pollutant Discharge Elimination System (NPDES) including Municipal Separate Storm Sewer System (MS4), Multi-Sector General Permit (MSGP), Rapid Infiltration Basin (RIB), and 401 certifications.
Seller/sector type	Point sources and nonpoint sources (e.g., agriculture,

	hydroelectric facilities~~, unregulated stormwater sources~~).

TAC Reviewers: MSGP and RIB were added as potential buyers. Are these permittees able to trade similar to NPDES permittees? Do they have numeric limits that must be achieved? When are these sources most likely to exceed limits or in the context of trading, when would credits be needed? Is there the potential for localized impacts from these sources if trading is used to meet discharge limits?

Trading can be used to meet all or part of a point source discharger's water quality-based effluent limit (WQBEL), assuming all required treatment technology has been installed. Trading can also be used to offset point source pollutant loads under other scenarios, including:

- *To offset existing point source discharges to a CWA §303(d)-impaired water body with an EPA-approved TMDL or similar watershed analysis needed to support trades. Section* ***Error! Reference source not found.~~Error! Reference source not found.~~*** *~~4.5~~ provides more criteria on pre-TMDL trades with existing discharges. Point sources must ensure the discharge does not increase or further impair the water body for the specific pollutant; and*
- *To offset new or expanding point source discharges to a §303(d)-impaired water body with or without an EPA-approved TMDL. Point sources must ensure their discharge does not increase or further impair the water body for the specific pollutant consistent with the requirements of 40 CFR 122.4 (i).*

TAC REVIEWERS: Note that if the State has done a pollutant load allocation, 122.4(i) only allows for a new discharge if the permittee demonstrates or permitting authority determines that there is available load allocation. So if the TMDL does not have a reserve allocation any reduction from a trade must be demonstrated before a new point source could be authorized.

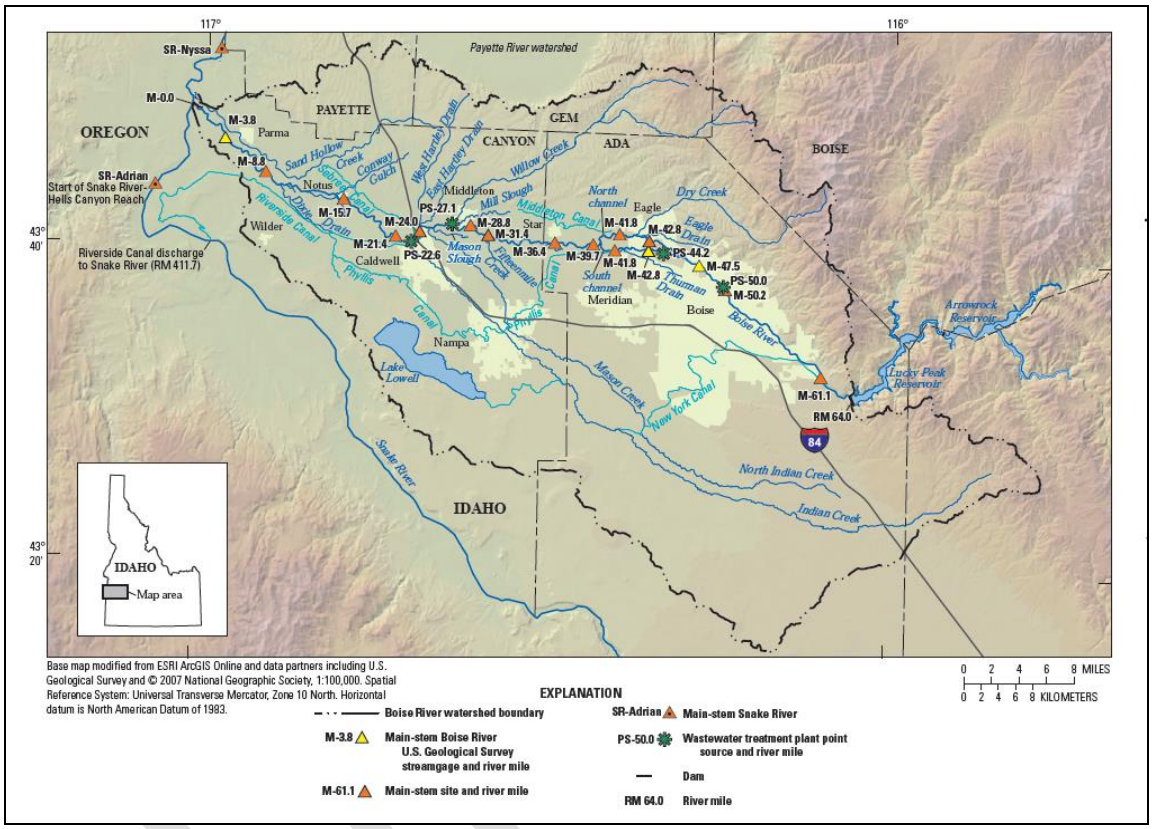
Reference to this Framework in a regulatory document does not alter the responsibility of an NPDES permittee to comply with the terms of that regulatory document. NPDES permittees participating in trades are responsible for the quantity and quality of the credits even when a third party acts as an aggregator or reviewer of credits.

2.2. Location: Trading area

The trading area for this Framework is the Lower Boise River watershed (*see* Figure 2.2), as delineated by DEQ in the TMDL (DEQ, 2015). The lower boundary of the trading area

is the confluence of the Snake and Boise Rivers[5]. The upper boundary of the trading area is Lucky Peak Dam. Eligible Projects in this trading area can generate credits for eligible permittees in this trading area.

Figure 2.2. Trading Area



2.3. Eligible Pollutants & Credit Life

This framework currently supports trades for the following credit types[6]:

Table 2.3 Total phosphorus credits eligible under this Framework

Credit Type	Unit	Time	Credit Life
Total phosphorus (TP)[7]	lbs	per year	1 year

[5] It should be noted that consistent with the 2015 Total Phosphorus TMDL Addendum, Sand Hollow Creek is not considered as part of this Water Quality Trading Framework.

[6] Other credit types can be added to the Framework in future updates.

[7] Total phosphorus (TP) includes all chemical forms of phosphorus. The Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015) is written for TP. There is not sufficient understanding or data to account for dissolved and particulate phosphorus differently (WP, 2015). Permit limits are typically written for TP.

Credit Life: Total phosphorus

A credit's "life" is the period from the date it becomes usable by a permittee for compliance purposes through to the date when it expires and is no longer valid for compliance purposes. Credit life needs to be based in science and tied to the critical period(s) for a watershed.

For this Framework, a nonpoint source credit produced in any one month can be used to offset discharges in any future month ~~throughout~~ during a permittee's 12 month compliance period[8]. This reflects complex groundwater interactions and numerous diversions of surface water with associated return flow in the Lower Boise River watershed[9].

TAC Reviewers: At this time EPA is not supportive of an annual credit life noting that not all forms of phosphorus have equal impacts on loads in the groundwater, and which BMPs affect phosphorus in the groundwater are not yet known.

EPA noted that they would consider supporting a seasonal credit life, where those projects that operate during the irrigation season and are most likely to affect surface water runoff, would have a credit life April-October and those non-irrigation related projects that reduce Total Phosphorus outside the irrigation season and thus groundwater, would have a credit life November-March.

As of 5/4/16 – Willamette Partnership is organizing and facilitating a meeting of technical staff from USGS, EPA, IDEQ, and TFT to discuss the scientific information that provides the underlying basis for credit life. Outcomes of discussions will be incorporated in future drafts.

[8] If permit limits and exceedances are calculated on a monthly-instead of annual-basis, the permittee should aggregate its monthly permit limit exceedances into an annual total to compare against annual credit totals from nonpoint sources. Annual credits can be used to offset the 12 month total monthly permit exceedances.

[9] Specifically, water that is diverted from the mainstem (and the associated phosphorus load) accumulates in shallow groundwater during the irrigation season and then permeates to the Boise River year round in "base flow" (WP, 2015). The result is that point source phosphorus loading and nonpoint source phosphorus reductions are released relatively evenly throughout the year (WP, 2015; Etheridge, MacCoy & Weakland, 2014; Etheridge, 2013). As a result, there is no need for seasonal credits.

3. Trading Eligibility

3.1. Eligibility for Credit Buyers

Proposed trades are described in a trading plan, which is submitted for reviewed by EPA and DEQ as part of the procedures for NPDES permits. EPA and DEQ will review a submitted trading plan and proposed modifications, as necessary, to assure the plan complies with the CWA and NPDES permitting requirements. A permittee's trading plan may incorporate the terms of this watershed trading framework by reference, or it may include all specific details within the permit itself. Trading plans must include the following elements, many of which are addressed in this Framework:

- *Trading area*: Justify and describe how designated uses will be protected.
- *Baseline*: Sources of applicable regulation or law in trading area and how baseline is expressed (e.g., federal, state, and local regulations applicable to the land uses at play in the trading area, TMDLs and/or TMDL implementation plans, and trading guidance/framework).
- *Description of credit quantification methodology*: Describe how pre- and anticipated post-project conditions are modeled; how credit values are derived; how baseline is accounted for.
- *Description of the proportions of public and private funds used to complete credit generating projects.*
- *Trading ratio*. Articulate assumptions, calculations, and components.
- *Allowable project types*: Identify quality and performance standards.
- *Credit life*: Identify when credits become valid, how long credits remain valid, and renewability of credits.
- *Project site design, maintenance, implementation, and performance confirmation*. Determine whether these components are required and their frequency.
- *Verify project site implementation and performance*: Identify which entity will perform, the frequency, and the standards by which performance is judged.
- *Credit tracking*: Identify where information on trades will be made available.

3.1.1. Meeting Technology-Based Effluent Limitations (TBELs)

The CWA requires point sources to meet the more stringent of TBELs or WQBELs. A point source that has attained applicable TBEL requirements, if any, can obtain credits to achieve its WQBELs.

3.1.2. Avoiding localized impacts

A permit's trading plan needs to analyze the potential for localized impacts and be specific about measures and/or monitoring that will be completed to ensure there are no localized impacts. A localized impacts assessment should address the following:

- Near-field analysis of potential negative impacts on local aquatic biota in downstream reaches from a facility as a result of total phosphorus concentrations associated with that facility's ~~'s~~ effluent discharge.
- Comparison of effluent data to relevant ~~regional numeric nutrient criteria~~watershed specific information such as the TMDL for Total Phosphorus and associated modeling (AQUATOX).
- ~~Consideration of all parameters that may a negative impact on biota: chlorophyll *a*, turbidity, dissolved oxygen, pH, biological oxygen demand (BOD), indices of biotic integrity for macroinvertebrates or fish~~Stream reach concentrations of Total Phosphorus below a facility do not exceed
  - Point sources at 0.1 mg/L TP May–September
  - ~~o~~ Point sources at 0.35 mg/L TP October–April (except Idaho Dep't of Fish & Game Eagle and Nampa facilities, which are set at 0.1 mg/L year-round.

TAC Reviewers: These proposed changes were based on feedback received from the municipalities. The proposed changes are to focus the language more specifically to the water quality objectives. It was noted that DO, pH and BOD were considered in the TMDL analysis and are therefore captured as part of the targets.

3.1.3. Compliance with Antidegradation and Anti-backsliding

No trades can lower existing water quality (anti-degradation) consistent with 40 CFR §131.12 (anti-degradation), ~~CWA §402(o) and 40 CFR §122.44(l) (anti-backsliding),~~ and related state requirements. In addition, subject to limited exceptions, no trades can result in the issuance of a permit with effluent limitations that are less stringent than the comparable limitations in the previous permit consistent with CWA §402(o) and 40 CFR §122.44(l) (anti-backsliding). Compliance with ~~These~~ these criteria will be assessed and documented in individual permits, licenses or orders where trading is being considered. The Lower Boise River Total Phosphorus TMDL addendum analysis should be used to support this analysis.

3.2. Project Eligibility for Credits

Both point sources and nonpoint sources are eligible to generate credits. However, not all projects can create credits. There are several checks that make sure projects create pollution reductions that lead to the water quality improvements consistent with permit requirements and TMDL goals:

- *Project site is "hydrologically connected" to the Lower Boise River system*: A hydrologic connection simplifies ratios and credit quantifications. Hydrologic connection between a site and the Lower Boise River system can be demonstrated through connection to a tributary, drain, canal, and/or lateral as identified in the National Hydrography Dataset flowlines, and those identified by Idaho DEQ[10] ~~(available upon request)~~, or where it can be otherwise demonstrated by the project developer that a conveyance (e.g., ditch, drain, pipe) or other direct connection is in effect (The Freshwater Trust, 2015). Project sites that cannot demonstrate a hydrologic connection are disqualified from generating credits.
- *Project uses an approved project type and updated Quality Standards*: All ~~P~~project types that generate credits need to be supported by enough information about efficacy and implementation to ensure that they deliver the promised water quality benefits. Credits can be generated from project types and associated quantification methods pre-approved by DEQ ~~(Appendix A)~~ or from innovative project types approved through the process outlined in Section 10.1 of this Framework.
- *Credits come from project types installed after a base year*: Projects implemented after December 31, 2012, the data year used to build the Lower Boise River Total Phosphorus TMDL addendum (DEQ, 2015) may be eligible to generate credits if sufficient data is available to demonstrate pre and post project conditions.

To TAC Reviewers: As discussed, 2012 is the date of the TMDL analysis. Comments and discussions were had regarding rewarding early adopters. The State Guidance states that "a limited look-back period…typically no more than 2 years before a TMDL is approved by EPA". We need to ensure that other provisions (e.g., credit life) still enable some of these early projects.

A limitation to the "look-back" approach may be that the information and records necessary to calculate pre-project conditions may be missing or incomplete.

[10] National Hydrography Dataset flowlines are available for download from IDEQ at <need to add link>

- *Projects are consistent with other laws*: To generate a credit, a project should comply with applicable federal, state, and local requirements necessary to implement the project.

3.3. Point and nonpoint source credit baseline

Both point and nonpoint sources need to meet some minimum requirements prior to selling credits. These minimum requirements are known as "baseline." For point sources, the baseline requirement is that all applicable TBELs must be met prior to generating credits. Point sources under a compliance schedule cannot generate credits until they have reduced pollutant loading beyond the final effluent limits in their permit. For hydroelectric facilities, the baseline requirement is that all 401 license conditions must be met prior to generating credits.

IDEQ/EPA Reviewers: Comment received regarding the statement that *all* 401 license conditions must be met prior to generating credits being too broad in scope. Are there elements of 401 licenses that would not relate or be over-burdensome for hydro-electric facilities to meet in the context of water quality trading?

For nonpoint sources, this Framework establishes staged baseline obligations for different trading-related implementation windows consistent with the Lower Boise River Total Phosphorus TMDL addendum. This addendum acknowledges that it "may take decades" to achieve the targets established in the TMDL and therefore relies on a "staged implementation strategy" (section 5.5.1). In particular, the TMDL notes that "[i]f trading has been authorized in the area covered by this TMDL, any phased implementation plan targets for meeting load allocations may be used to derive trading baseline requirements for individual landowners wishing to sell water quality trading credits" (section 5.5.2). Staged implementation of a TMDL to achieve water quality goals is recognized under existing EPA guidance (EPA, 2006). This phased approach to baseline for nonpoint sources is consistent with national EPA policy.

To account for the time it takes to plan, receive local government approval, integrate trading into permits, and develop the systems necessary to implement trading, each phase runs for ten years.

Stages of the nonpoint source baseline are described below for on-farm BMPs, ~~in-drain treatment~~ projects treating receiving surface water and groundwater impacted by agricultural runoff[11], ~~stormwater, and septic system upgrades~~. All baseline requirements are summarized in Table 3.5.

[11] Projects such as constructed basins and constructed wetlands are examples of projects treating receiving surface water and groundwater impacted by agricultural runoff.

To TAC Reviewers: We have not come to agreement on the appropriate term for those projects such as constructed basins and wetlands. The above language was suggested as a means of capturing the function of those types of projects and a footnote was added to provide examples of project types. Are there others that would fall in this category?

Based on meeting discussions and feedback there appears to be agreement that the design standards and quantification methods required to determine water quality benefits and credits in the context of this trading framework are not fully developed (for stormwater and septic tank upgrades) and while the TAC recognizes that they may be added in the future, they should not be included at this time.

TAC Reviewers: Feedback from EPA is that all stages of baseline must demonstrate progress towards meeting load allocation requirements. The actions and quantity of progress is not defined and discussions continue. The following table provides options and considerations currently being considered.

OPTIONS	CONSIDERATIONS
Option A: Retire 20% of credits for all non-point credit project types as part of a trading ratio of 1.2:1 for meeting both baseline AND net environmental benefit.	A percentage reduction is a straightforward approach to baseline. Requiring a standard contribution may favor those landowners who are implementing relatively cheap practices (likely those who are late adopters) while failing to reward early actors.
Option B: On-farm: Phase I: conservation plan and implementation of one BMP from list OR conservation plan and implementation of nutrient management plan. Phase II: implementation of second BMP OR nutrient management plan and BMP project. Off-farm: % retirement of credits for all phases.	Requiring BMP implementation in the first phase may satisfy requirement of demonstrating progress. The original intent of phasing in baseline requirements was to increase program participation by reducing up-front costs. Requiring implementation of BMPs as part of baseline may negate the need for phased implementation. Nutrient management plans are intended to maximize utilization of nutrients and minimize loading to the environment.

- Stage 1 (Projects completed between 2015 and 2025)
    - *On farm BMPs*: Participating landowners have completed a conservation plan[12] consistent with NRCS guidelines covering the entire agricultural operation.[13]

[12] A "conservation plan" is the formal documentation of the condition of soil, water, and other natural resources on a given farm or ranch, along with the land manager's plans for maintaining or improving the condition of these resources consistent with TMDL LA goals and applicable regulations moving forward. A conservation plan may include the following: resource inventory checklist, soil test results, nutrient management planning, livestock grazing

The conservation plan is the foundation for achieving progress toward the load allocations because it: 1) provides landowners with information on how to improve yields, reduce water use, and improve conservation overall; 2) cultivates additional landowner awareness about the effect of current practices on local waterways and potential operational efficiencies; and 3) fosters relationships between landowners and local NRCS and conservation district staff, who can provide technical assistance and access to other programs that support pollutant load reductions (e.g., Farm Bill and other cost share programs).

- ~~*In-drain*~~*Receiving surface water and groundwater treatment*: ~~Participating project developers may use the estimated efficiency rates for watershed- and field-scale sediment basins (found in Appendix A of this Framework)~~. Project ~~developers~~ proponents have completed a conceptual design of a proposed project~~n operation and maintenance plan, including a direct measurement plan to determine the actual TP reductions associated with the project type.~~ formal plan for direct measurement of total phosphorous or approved water quality surrogate (e.g. suspended solids) by standard sampling and analytical methods, and a formal operation and maintenance plan for the proposed life of the project. NOTE: The estimated efficiency rates for watershed- and field-scale sediment basins (found in Appendix A of this Framework) may be used for planning purposes in Stage 1. ~~This provides concrete data regarding the effectiveness of the practice in the Lower Boise system.~~

- Stage 2 (Projects completed between 2026~~-~~ and 2035):
  - *On-farm BMPs*: Participating landowners have a conservation plan consistent with NRCS guidelines for their entire agricultural operation and implement at least one approved BMP (Appendix A) affecting the site where credits will be generated. The reductions from this baseline BMP

schedule, irrigation schedule, conservation program participation, and/or an evaluation of potential resource concerns. The goal of a conservation plan is to increase the long-term productivity of the farm or ranch by planning for and documenting progress toward the sustainable use of its natural resources. Conservation plans ~~may be developed by NRCS staff or by an NRCS certified technical service provider.~~should follow the directions offered in NRCS's Field Office Technical Guide and may be developed by agency staff responsible for implementation of the *Idaho Agricultural Pollution Abatement Plan* (ISDA, SWCD, NRCS) or by a certified technical service provider approved by DEQ.

[13] The purpose of this operation-wide requirement is to ensure that that the credited activities have not displaced water quality impacts elsewhere within the operation.

make progress toward the TMDL load allocations. The pollutant load reductions generated from the non-baseline BMP are creditable.[14]

- ~~*In-drain*~~ *Receiving surface water and groundwater treatment*: ~~It is not possible for these project types to add another project type. Instead,~~ XX% of credits documented by direct measurement of total phosphorus or approved water quality surrogate (e.g., suspended solids), ~~based on one-half of the load reductions expected in load allocations~~ will be set aside, or retired, to meet baseline requirements and will not be eligible for trading[15]. **TAC Reviewers**: Based on discussions among TAC participants there seems to be general agreement that although CW/CB projects do not contribute TP, they should have a baseline requirement to create equity with farm projects and fulfill requirement to demonstrate progress. Need to establish what baseline requirements would be for CW/CB projects. Stage 3 (Projects completed between 2036-onward):
    - *On-farm BMPs*: Credits can be generated from BMPs ~~the~~ to improve water quality in the shallow groundwater. Dissolved phosphorus delivered to the river system via shallow groundwater is understood to be a significant factor in nonpoint source loading (DEQ, 2015; WP, 2015). By this third stage, there should be a better understanding of the interaction between BMPs and shallow groundwater. To meet baseline, BMPs will need to be in place to achieve the load reductions from surface water runoff assumed in the TMDL load allocations.

Receiving surface water and groundwater treatment: ~~These project types cannot add another project type. Instead, XX% of credits, based on achieving the full load reductions expected in load allocations will be set aside, or retired, to meet baseline requirements.~~ XX% of credits documented by direct measurement of total phosphorus or approved water quality surrogate (e.g. suspended solids) will be set aside, or retired to meet baseline requirements and will not be eligible for trading[16].

[14] Appendix B4 provides more information on calculating the load reduction from two overlapping or non-overlapping BMPs.

[15] This contribution to unidentified reductions in Total Phosphorus in tributaries to the Lower Boise River assumed by the TMDL model. Credits are determined by the difference in the measured water quality parameter between inlet and outlet of a constructed basin/wetland (CB/CW) or other project type.

[16] This is a contribution to unidentified reductions in Total Phosphorous in tributaries to the Lower Boise River assumed by the TMDL model. Credits are determined by the difference in the measured water quality parameter between inlet and outlet of a constructed basin / constructed wetland (CB/CW) or other project type.

TAC Reviewers: This table will be updated once further decisions are made regarding baseline requirements. Previous comments stated that the table provided a useful summary reference and should remain in the document.

Table 3.3 Baseline requirements

Seller Type	Baseline for Seller	Eligible credit-generating actions	Timing	Source of baseline
Point source	Effluent limits in their NPDES permit	Pollution reductions beyond permitted effluent limits	Prior to generating credits	NPDES permits
Hydroelectric facility	401 license conditions	Pollution reductions beyond license conditions	Prior to generating credits	401 certification
Nonpoint source (on farm)	**Stage 1**: Completed conservation plan[17]	All pre-approved BMPs	2015–2025	TMDL load allocation goals, state and local regulations.
	Stage 2: 1. Completed conservation plan 2. One BMP in the area or field where credits will be generated	All pre-approved BMPs	2026–2035	
	Stage 3: 1. Completed conservation plan 2. BMPs to control surface runoff in the area or field where credits will be generated	BMPs that address groundwater loading	2036–onward	
Nonpoint Source (~~In-~~	**Stage 1**: Prepare a conceptual	All pollutant reductions	2015–2025	TMDL load allocation

[17] A "conservation plan" is the formal documentation of the condition of soil, water, and other natural resources on a given farm or ranch, along with the land manager's plans for maintaining or improving the condition of these resources moving forward. A conservation plan may include the following: resource inventory checklist, soil test results, nutrient management planning, livestock grazing schedule, irrigation schedule, conservation program participation, and/or an evaluation of potential resource concerns. The goal of a conservation plan is to increase the long-term productivity of the farm or ranch by planning for and documenting progress toward the sustainable use of its natural resources. Farm managers should consult with local organizations (e.g. NRCS, SWCDs, FSA) in the development of a conservation plan for their operation. Conservation plans may be developed by NRCS staff or by an NRCS-certified technical service provider.

~~drain)~~receiving surface water and groundwater treatment	design, a formal plan for direct measurement, and a formal operation and maintenance plan~~Develop and implement direct measurement plan to determine TP reductions~~.			goals, state and local regulations.
	Stage 2: XX% of credits documented by direct measurement of total phosphorous or approved water quality surrogate~~of credits set aside based on ½ of load allocations~~	All pollutant reductions after baseline has been met	2026–2035	
	Stage 3: YY% of credits documented by direct measurement of total phosphorous or approved water quality surrogate~~of credits set aside based on meeting load allocations~~	All pollutant reductions after baseline has been met	2035–onward	

3.4. Use of public conservation funds and credit stacking

Credits need to come from projects creating new (or "additional") water quality benefits." Projects created to mitigate wetland impacts (credit stacking) or funded fully with public conservation funds like EPA 319 dollars were not designed to generate water quality *credits*, even if they create water quality *benefits*.

The portion of projects used for compliance/generating credits cannot be funded with cost share or other public conservation funds.[18] Public conservation funds CAN be used to help nonpoint sources meet baseline requirements (*see* Section 3.5).

There is a lot of value in leveraging multiple funding sources to create bigger, more beneficial projects. The credit buyer will just need to demonstrate that they meet the requirements above. Proportional accounting is one way to show how credits generated from a project site are subdivided proportionately according to financial contribution (see WP et al., 2014). For example, if NRCS' Environmental Quality Incentives Program (EQIP) cost shares 50% of a sediment basin, and a farmer pays for 50%, then the farmer could sell 50% of the total credits from the project. This means that if the project generated 10 remaining pollutant reductions, only 5 could be sold as credits (assuming other adjustments have been applied or were not needed).

TAC Reviewers: This is consistent with the Joint Regional Recommendations and the approach that Oregon took in their recently approved rule and the current draft State Water Quality Trading Guidance.

[18] Public conservation funds are defined here to include those targeted to support voluntary natural resource protection and/or restoration. Public loans intended to be used for capital improvements of public water systems (e.g., state Clean Water Revolving Funds and USDA Rural Development funds) and utility sewer, stormwater, and surface water management fees are not considered public funds dedicated to conservation.

4. Total Phosphorus Credit Quantification

If a project type is eligible, the pollutant reductions generated by the on-farm BMP must be estimated or measured (quantified) in order to generate credits. Quantification is the process of developing an estimate or measurement of the pollutant reduced at the end of a pipe (point source), or at the edge of a project (nonpoint source). Pollutant reductions can be quantified in several ways to generate water quality credits. The methods currently approved for credit quantification in the Lower Boise River include:

4.1. On-farm BMPs

- Surface Irrigation Soil Loss (SISL) model in combination with approved individual on-farm BMP efficiency rates (Appendix A).
- Direct monitoring/measurement of total phosphorus reduction.
- Other quantification methods can be approved using the process described in the Section 10.1 of this Framework.

Quantifying credits using SISL follows the process below:

1. Using SISL, identify the total soil loss associated with irrigation and management practices at the field prior to implementing BMP(s).
2. Apply the appropriate efficiency rate(s) associated with the approved BMP(s) implemented at the field to determine the net reduction in total soil loss between pre-BMP and post-BMP conditions.

   *Net reduction in TP = Pre-BMP soil loss (tons) * BMP efficiency rate(s)*
3. Converted into total pounds phosphorus. The total phosphorus credits is represented by the following formula:

   TP Credits (lbs) = Net reduction in sediment (tons) x 2lbs TP/ton sediment

Appendix B provides a detailed description of SISL and its application to quantify TP credits from eligible on-farm BMPs.

4.2. Receiving surface water and groundwater treatment

- Direct monitoring/measurement of total phosphorus reduction.
- Other quantification methods can be approved using the process described in the Section 10.1 of this Framework.

~~4.~~5. Trading Ratios

Ratios can adjust credit quantities by either discounting the value of credits produced at the end of a pipe or edge of a field, or by multiplying the number of credits needed by a buyer. Ratios may account for: 1) Delivery from a field to a water body and through a water body; 2) Equivalency between different pollutants (e.g., between phosphorus and nitrogen for dissolved oxygen); 3) Uncertainty (e.g., measurement error); 4) Reserve (e.g., for credit generating project failure or temporary diminishment); and 5) Retirement/Water quality contribution (see EPA, 2007). This Framework will apply two types of trading ratio multipliers to all trades in the Lower Boise River trading area (*see* Table 5).

Table 5. Summary of trading ratios applicable in this Framework

Ratio Type	Ratio Multiplier	Notes
Delivery	N/A	All projects must have a direct hydrologic connection to perennial water bodies, which is a significant portion of land in the Lower Boise River trading area. ~~There is minimal attenuation of phosphorus as loads move through the watershed~~Phosphorus routing though the Lower Boise system is complex and not well understood or documented.[19] Because of the hydrologic connection eligibility criterion and ~~minimal attenuation~~current understanding of routing through the system, delivery ratios are not applied.
Equivalency	N/A	Equivalency ratios adjust between different forms of the same pollutant. This Framework addresses all forms of phosphorus—e.g., dissolved and particulate phosphorus—as total phosphorus because tools are not currently available to distinguish the effect of separate chemical forms of phosphorus. Likewise, this Framework does not

[19] Willamette Partnership. (2015) Lower Boise Framework Update: Findings and Recommendations. p5-6. Prepared for Idaho DEQ. Available upon request from Idaho DEQ. This Framework eliminates the location ratios by field type and municipal location that were included in the original Lower Boise Trading Framework (2010a).

Idaho Dep't of Environmental Quality (2015). Lower Boise River TMDL: 2015 Total Phosphorus Addendum. Available at https://www.deq.idaho.gov/media/60177413/lower-boise-river-tmdl-total-phosphorus-addendum-0815.pdf

		currently provide for equivalency between sediment, nitrogen, phosphorus, temperature, or other pollutants affecting algal blooms and dissolved oxygen levels. As a result, equivalency ratios are not included in this Framework at this time.
Uncertainty	2	After a permittee identifies its total annual phosphorus exceedance, that total is multiplied by two (2) to account for uncertainty. This multiplier accounts for the following factors (*see* EPA, 2014): • Meteorological conditions; • Variability in project type efficiency rates,[20] operations, and risk that the project type will fail; • Any time lag for restoration projects that take time to mature; • Credit estimation error; • Unknown differences in how dissolved and particulate phosphorus act in the watershed; and • Effects of agricultural water reuse on delivery of pollution reductions to the Lower Boise River.
Reserve	N/A	Point sources are responsible for maintaining their own reserves of credits to ensure compliance. As a result, reserve ratios are not used.
Baseline and Net environmental gain	0.2	A 0.2 factor is used to ensure that all trades make progress toward meeting load allocations and generate a net water quality benefit.[21]

TAC Reviewers: Consider whether uncertainty ratios should be requirement or discounted for Constructed Basins / Constructed Wetlands because factors listed as contributing to uncertainty are controlled and accounted for by direct measurement of total phosphorus. Uncertainty can still exist with direct measurement, thus the need for

[20] The BMP-specific uncertainty ratios included in the original Lower Boise Trading Framework (DEQ, 2010a) and discussed by The Freshwater Trust (TFT, 2015) are incorporated into and covered by this 2:1 uncertainty multiplier. As such, BMP-specific uncertainty factors are not applied when calculating credits generated from individual fields.

[21] This value is consistent with the nonpoint source water quality contribution required under the original Lower Boise Trading Framework (DEQ, 2010, Sec 2.2.7)

a monitoring plan that described processes for equipment calibration and methods of monitoring and frequency.

State Guidance notes that in combination, an overall trade ratio should be greater than 1.5:1. Current proposal is 2.2:1 with potential reductions to 2:1 for actions listed below.

The uncertainty ratio multiplier can be adjusted downward by as much as 0.2, with approval from DEQ and US EPA, if:

- The permittee can demonstrate, through direct measurement, in-stream water quality improvements in a manner that reduces the influence of uncertainty; or
- The permittee agrees to fund and undertake research initiatives investigating the effectiveness of project types at reducing dissolved phosphorus loads within subsurface and baseflow.[22]

The combined trade ratio cannot be less than 2:1.

TAC Reviewers: Consider whether just one or both of the conditions above should be met prior to providing discounted ratios.

Ratios will be reviewed in conjunction with the issuance and renewal of NPDES permits for point sources, and through license or order procedures.

[22] The Lower Boise River Total Phosphorus TMDL addendum identifies groundwater as a significant source of phosphorus loading (DEQ, 2015). However, credits cannot currently be generated by reducing phosphorus loading to groundwater because quantification methods approved for use under this Framework do not provide estimates of how it groundwater affected by BMPs.

~~5.~~6. Credit Characteristics

Once a pollutant reduction has been converted into a credit, there are several aspects of that credit that are important to define:

- *Credit life*: The life of a credit is described in Section 2.3 of this Framework, unless otherwise described for a certain project type in Appendix C.
- *Credits can be released when verified*: Most project types will start generating water quality improvements immediately. All credits can be released and used for compliance purposes as soon as these projects (and the relevant baseline requirement) have been implemented and verified as consistent with a project design and management plan (Section 7.1 of this Framework) and the associated project type quality standards (Appendix C).
- *No double counting credits*: The environmental benefits generated from a project type on one land area cannot be sold to two different credit buyers to offset two different impacts.
- *Credits are not property rights in the same way land and water rights are*. Similar to a point source's effluent limit, credits are tied to a specific permittee's authorization to discharge. Issuance of a permit to discharge does not convey any property rights of any sort or exclusive privileges to a point source. Just as EPA and DEQ may need to adjust a point source's effluent limit, credit requirements~~s~~ may also need to be adjusted.
- *Credit Banking:* Credits cannot be banked for use outside of the approved credit life (e.g., a pollutant reduction in 2012 cannot be used to offset a discharge in 2016).
- *Credit Renewal:* Projects can be renewed to generate credits in subsequent compliance cycles so long as they continue to function and are properly maintained (though the reductions may need to be adjusted to reflect the ratios and baseline requirements that apply at that future point in time).

~~6.~~7. Project Implementation and Assurance

All credit-generating projects making use of on-farm BMPs must be accompanied by a Project Design and Management Plan (Plan), prepared by a qualified individual (e.g., an NRCS certified planner or an NRCS employee or a certified crop advisor) (*see* Appendix C for qualifications).

~~Some p~~Project types, not making use of on-farm BMPs such as constructed basins/constructed wetlands, ~~may~~ will not require compliance with NRCS standards, but will be stamped by a Professional Engineer licensed in the State of Idaho and may require consultation with other experts ~~regarding the project's~~ in design, ~~installation~~construction, and operation and maintenance ~~requirements~~.

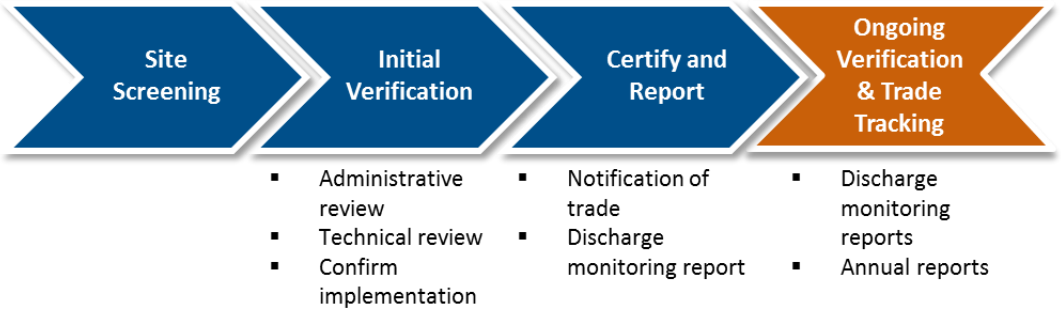
TAC Reviewers: Is this language sufficient to provide an equivalent standards requirement to NRCS requirements for on-farm BMPs? Are there design guidelines or state requirements for constructed wetlands/basins?

Once installed, projects are expected to be be maintained in accordance with the Project Design and Management Plan. Project developers must demonstrate that adequate funding and resources will be available to steward project sites for the duration of the project life.

Adequate land stewardship safeguards must be in place to protect the project from conversion for the duration of the project life. The protection period for each project is described in Appendix A, Table A1 (e.g., annual (1), five (5) or twenty (20) years). These minimum time periods recognize the balance between maintaining operational flexibility for sellers and the need to provide some certainty for buyers.

~~7.~~8. Process for Generating and Tracking Credits

This section describes the standard process to generate, review, and track credits over time and who performs each step.



~~7.1.~~8.1. Initial Project Screening

All projects can optionally undergo an initial project screening to determine eligibility and consistency with any baseline requirements. However, it is strongly encouraged that all projects go through an initial project screening, especially in the first two years of operating this Trading Framework. Project screening does not guarantee a project will be verified, but may help developers avoid unnecessary costs. Basic eligibility criteria for non-point sources are listed in Section 3.4 of the Framework. Project developers should also reference Appendix A for project types approved for credit generation. Initial project screening is conducted by the project developer or a DEQ designated third party verification entity. Documentation needed for initial project screening includes:

- Draft Project Design and Management Plan;
- Draft project protection (e.g., lease, easement, etc.);
- Documentation of meeting applicable baseline requirements; and
- Summary of project eligibility relative to requirements in this Framework.

Complete information is required for accurate evaluation of project eligibility. A positive screen result represents only a preliminary determination of the project's eligibility to generate credits. The type, quantity, and final approval of credits are confirmed in later phases of the credit cycle. Where a project does not receive a positive screen result, a justification and suggestion for remedy will be provided.

TAC Reviewers: Site screening is a pre-verification process that provides developers information on the eligibility of potential projects. Site screening does not negate or guarantee projects will be approved.

~~7.2.~~8.2. Initial Verification

~~In the first year for all credit generating projects~~All credit generating projects must be verified prior to credits being issued. For new credit generating projects, verification must be within one year of installation. For those pre-existing projects implemented after the base year, but prior to the current date, verification must occur within one year of the intended credit sale. DEQ maintains the regulatory oversight for project review, but will designate an independent 3rd party to review trades and the permittee to review their offset project performance (initial verification). That initial verification will include:

- *Administrative Review*: Confirms project eligibility. [This step may be expedited if the initial project screen has occurred].
- *Technical Review*: Confirmation that credits were quantified accurately.
- *Confirmation of Successful Project Implementation*: Confirmation that the project was installed (via a site visit or other means) consistent with approved eligibility, design and construction criteria for that project type (see Appendix C), and that baseline requirements have been satisfied. For point sources, confirm from DMRs the pollutant load reductions.

TAC Reviewers: Language was added to the initial verification section to create consistency with State Guidance, which requires verification to occur within one year of implementation. However, the language above addresses the issue of those projects which were implemented after the base year, but are not new projects (look back period).

Inspections of NPDES-Permitted Facilities for Point Source Credits

Proposed point source credit project plans are reviewed by EPA and DEQ as part of the procedures for NPDES permits.

~~7.3.~~8.3. Ongoing Verification

Ongoing verification will occur on a cycle described for each project type in Appendix C, and will be completed by the same verification entity used for Initial Verification. In addition, EPA, DEQ, or DEQ's designee, may visit the project sites to verify the documentation of the project design, maintenance, and monitoring performance. NPDES permit holders who purchased nonpoint source-generated credits remain

responsible for ensuring BMPs are properly implemented and the correct credit quantification is completed.

~~7.4.~~8.4. Forms and Reporting

After Initial Verification, and when credits are ready to be issued, the verification entity will certify that all aspects of the projects are in place and provide a certification of the pollution reduction credit to DEQ, or DEQ's designee, to register the credits into its trade registry.

Trading parties must generate and maintain records, which may include the project's verification report, certification, and other relevant information needed to register credits. Records shall be maintained in accordance with applicable record retention policies and requirements.

To DEQ: Are there other records retention requirements that would be applicable to cite to here?

In addition, the permittee will need to provide a Discharge Monitoring Report and Annual Report associated with any trading activity.

~~7.4.1.~~8.4.1. Discharge Monitoring Reports

If trading occurs, a point source discharger will report its actual average monthly effluent discharge, the amount of credits sold or bought for that period, and its adjusted discharge (the actual discharge plus or minus any credits traded). Trading activity must be summarized for DEQ in the following month's DMR report.

A permitee can demonstrate compliance for any exceedance of a permit limit by demonstrating that the exceedance is appropriately offset by ~~violation occurs when the amount of the point source's actual discharge exceeds the amount of its base limit plus~~ the amount of purchased credits minus any credits sold.

TAC Reviewers: This submittal date gives a point source discharger time to complete sample analysis for any nonpoint source monitoring conducted near the end of the month and find replacement credits if its credit need has not been met.

~~7.4.2.~~8.4.2. Annual Report

The discharger must also submit an annual report to DEQ detailing all trade activity for the reporting period as well as performance of the associated credit generating projects. The credit adjustments shown on the DMRs must match the credit totals shown in the Annual Report.

~~7.5.~~8.5. Trade Tracking Database

DEQ or a DEQ designated entity is responsible for tracking trades and the day-to-day oversight of trading. ~~DEQ may authorize a third party to assist with those tasks~~. All trade transactions must be entered into a single trade-tracking database. Use of a single trade-tracking database for the Lower Boise River trading area ensures:

- Credits are not used more than once;
- All credits meet the same verification standards prior to being registered and sold;
- Trading activity (e.g., account balances, transaction records) can be readily tracked; and
- DEQ and public can easily review of trading programs.

~~8.~~9. Compliance and Enforcement

~~3.5.~~9.1. Permittee Compliance

Permittee compliance is demonstrated through submission of DMRs and annual reports~~Compliance will be ascertained through the permittee's DMR and annual reports~~, which shall ~~demonstrate~~ include documentation that it has secured and continues to hold an adequate credit balance to meet its established effluent limits. The DMRs, annual reports and other available evidence will provide a basis for EPA and/or DEQ compliance determinations. A point source that relies on trading to comply with permit requirements is responsible for assuring the availability, adequacy and validity of any credit and assumes any compliance risk or uncertainty associated with the trade. The unavailability, inadequacy, invalidity or other deficiency of any credit relied on by a point source is not a defense to permit noncompliance. Enforcement of the trading program as detailed in this Framework shall be consistent with EPA and DEQ enforcement policies and guidance.

9.2. Project Compliance

For Projects that fail to meet performance standards during ongoing project review, credits will be suspended until corrective action are taken and verified by DEQ or a DEQ-designated verifier. For projects where corrective action is not taken, then the project and all associated credits will be canceled.

TAC Reviewers: WQT programs typically have a specified period in which corrective actions must be taken before credits or projects can be reinstated. This period is likely depended on the project type. For example if the project include vegetative planting that fails to grow or are damaged by natural events, an appropriate period would be the time it would take for re-vegetation to meet design standards.

~~9.~~10. Program Improvement and Tracking

Adaptive management is a systematic approach for improving natural resource management, with an emphasis on learning about management outcomes and incorporating what is learned into ongoing management (feedback loop). Adaptive management includes processes to improve the elements of trading guidance, frameworks, or plans with new information over time and may focus on improving program operations, trade administration, quantification methods, and overall effectiveness. Overall, the Boise River Watershed Advisory Group (WAG) and DEQ will oversee adaptive management of this framework.

~~9.1.~~10.1. Adding new Project ~~Type~~ types and/or quantification method

Quality standards development is essential for consistently and legitimately translating ecological benefit into a credit that can offset a regulated impact. These quality standards can be used in site screening, site design & implementation, verification, certification, and registration to predictably and fairly operate across watersheds as applied to different permittees. A list of approved on-farm BMPs for this Framework can be found in Appendix A. This list sets out which BMPs are currently recommended for trading in this trading area. Appendix C describes each BMP's quality standards.

New creditable project types may be developed and added to the Lower Boise Trading Framework by following the steps outlined in Table 10. Project type revisions may be triggered by monitoring results or any other monitoring of the project type's overall effectiveness and impact on other environmental parameters, as well as through research of the project type's performance on other sites.

TAC Reviewers: This is a skeleton process that follows the current State Guidance on approving new types of BMP and Quantification Methods (Chapter 7). Process outlined in Table 10 assumes that ISWCC is active and will continue to play role in approving new BMP types.

Table 10. Adding new, creditable on- and off-farm project types

Process Step	On-Farm Projects	Off-Farm Projects
Step 1: Prepare and Submit Proposed Project Type Package	New practices, existing practices already on the Idaho Agriculture Pollution Abatement Plan[23] (APAP) list (ISWCC-DEQ 2015), or improved design, measurement, or calculation methods to BMPs already on a DEQ-approved BMP list may be nominated by anyone for inclusion on a trading framework's BMP list. Each proposed BMP package must contain a description of the BMP and how it works; where the BMP should be applied (e.g., appropriate site conditions); potential side effects and ancillary benefits; monitoring requirements; design, installation, operation, and maintenance requirements; a method for quantifying credits, including any appropriate BMP efficiency or uncertainty ratio; and substantiating information (e.g., background and technical documentation, protocol for applying the method, estimation of method accuracy, sensitivity, and uncertainty). The proposed BMP package must be submitted to DEQ or its designee.	New project types, existing projects already approved under this trading framework, or improved design, measurement, or calculation methods to project types may be nominated by anyone for inclusion on a trading framework's list. Each proposed project package must contain a description of the project and how it works; where it should be applied (e.g., appropriate site conditions); potential side effects and ancillary benefits; monitoring requirements; design, installation, operation, and maintenance requirements; a method for quantifying credits, including any appropriate project efficiency or uncertainty ratio; and substantiating information (e.g., background and technical documentation, protocol for applying the method, estimation of method accuracy, sensitivity, and uncertainty). The proposed project package must be submitted to DEQ or its designee.

[23] The Idaho Agriculture Pollution Abatement Plan is Idaho's response to CWA §208 (PL 92-500), detailing how agricultural nonpoint source pollution must be managed. This plan includes a list of nonpoint source BMPs that can be used in Idaho to achieve water quality benefits.

Step 2: Initial Screening of Project Type Proposal	DEQ or its designee will perform an initial screening of the package for completeness. DEQ then forwards complete packages for review by Idaho's BMP technical committee, which is comprised of NRCS, DEQ, ISWCC, and other agencies and administered by ISWCC. Additional technical experts may be engaged to review any proposed quantification methods. The BMP committee only reviews nonpoint source BMPs.	DEQ or its designee will perform an initial screening of the package for completeness. Additional technical experts may be engaged to review any proposed quantification methods.
Step 3: Review Process and Criteria for Project Type Consideration	The BMP technical committee will review the package. If the proposed BMP is already included in the APAP, the committee will only review the water quality trading portion of the BMP package and related supporting documentation for its consideration on the trading framework BMP list. If the BMP is not included in APAP, the BMP technical committee can reject, or proceed to add it to the water quality trading BMP list if it is found acceptable. If the proposed BMP involves new technology or methods for which data and experience are insufficient to support credit quantification, the BMP will initially be approved only if the BMP can be directly measured and if the monitoring is scientifically credible ~~and not cost prohibitive~~. If the practice's measurements are too variable based on type of crop planted or field size, it may only be allowed using modeling or BMP efficiency	DEQ or its designee will review the content of the proposed project package. If the proposed project involves new technology or methods for which data and experience are insufficient to support credit quantification, the project will initially be approved only if the pre and post project conditions can be directly measured and if the monitoring is scientifically credible and not cost prohibitive.

	rates. Once approved by the BMP technical committee, proposed BMPs will be presented to the Lower Boise River Watershed Advisory Group for approval to be added to the list of acceptable BMP types for the trading framework.	
Step 4: DEQ Concurrence, Public Notice and Comment	If the BMP technical committee recommends the BMP, it is forwarded to DEQ to conduct a public notice and comment period. Comments will be limited to the new BMP and not to the program or the list of BMPs that have already been approved for that trading framework or plan.	If DEQ or its designee initially approves the project type, a public notice and comment period will be conducted. Comments will be limited to the new project type and not to the program or the list of project types that have already been approved for that trading framework or plan.
Step 5: Final Decision/Addition to creditable Project Type List	DEQ may ~~will~~ revise the project type based on public comments, in consultation with the technical experts, and issue its final decision. If it is approved, the project type and associated quantification method will then be placed on the appropriate project type lists for a trading framework or plan. Revisions to project types, revisions to a quantification method, or a new quantification method for a project type that has already been approved will follow the same process as for adding a new project type. Project type revisions may be triggered by the monitoring results or any other monitoring of the project type's overall effectiveness and impact on environmental parameters, as well as research of the project type's performance on other sites.	

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Appendix A: Eligible On-farm BMPs

The following BMPs are eligible to generate credits, pending the development of updated BMP quality standards for each BMP.

Table A1. Eligible BMPs

BMP Type	Approved Quantification Method	BMP Efficiency Rates[24]	Design Criteria	Lifespan
Sediment basin (field scale)	SISL	75%	NRCS 350	20 years
Sediment basins (watershed scale)	SISL	65%	NRCS 350	20 years
Filter strips	SISL	50%	NRCS 393	1 season
Underground outlet (years 1-2)[25]	SISL	85%	NRCS 620	2 years
Underground outlet (after year 2)	SISL	65%	NRCS 620	18 years
Straw in furrows	SISL	85%	NRCS 484	1 season
Sprinkler irrigation	SISL	100%	NRCS 442	15 years
Microirrigation	SISL	100%	NRCS 441	10 years
Tailwater recovery	SISL	100%	NRCS 447	15 years
Surge irrigation	SISL	50%	NRCS 449[26]	1 season
Constructed wetland (farm scale)	SISL	~~85~~65%	NRCS 656	15 years
Cover Cropping	SISL	TBD[27]	NRCS 340	1 year
Residue Mgmt (No Till)	SISL	90%	NRCS 329	1 year

TAC Reviewers: The table presented in this draft varies from what was presented in Water Quality Trading Note VI. As the footnote above elaborates, uncertainty ratios were not included in the efficiency rate here and thus the difference.

Reviewers noted that 85% is high for the constructed wetland BMP and provided additional information to support 65% recommendation. TFT technical analysis recommended a efficiency rate of 75%. In discussing with staff at TFT noted that a high

[24] These BMP efficiency rates are based on the analysis completed by The Freshwater Trust (TFT, 2015) to update the BMP efficiency rates included in the original Lower Boise Trading Framework (IDEQ, 2010). Unlike the original Lower Boise Trading Framework, the BMP efficiency rates in Table 4.1 do not incorporate BMP-specific uncertainty factors. These have been excluded from the field-level credit calculation process, and are instead incorporated into and covered by the 2:1 uncertainty multiplier (see Section 4.3 of this Framework).

[25] This BMP's effectiveness drops after two years, and so the remaining years of the BMP must be decreased.

[26] NRCS Practice Standard 449 – Irrigation Water Management, includes guidance on a variety of irrigation techniques, including "surge irrigation". Additional information can be found at https://efotg.sc.egov.usda.gov/references/public/ID/449_0312.pdf.

[27] This BMP was not included in the original 2010 Lower Boise Trading Framework. Based on a literature review, The Freshwater Trust suggested a 60% efficiency rate (TFT, 2015). This efficiency rate should be calibrated and tested through pilots prior to incorporation into Table 4.1.

degree of uncertainty exists with on-farm wetlands and felt a lower rate was appropriate.

Several reviewers noted that straw in furrows is not a common practice in the Lower Boise watershed. Should this be removed from the list?

Several reviewers noted that while cover crops are an important part of winter time soil retention, it was questioned as an appropriate BMP for addressing irrigation related TP loss. No efficiency rate is currently suggested. Should this be removed from the list?

~~Other agriculture related project types discussed, but will need additional research to determine if the appropriate level of scientific information, guidelines and quality standards are available.~~

~~-Land conservation/restoration~~

~~-stream bank restoration, revegetation~~

~~-forest buffers~~

For Residue Management (No Till) the efficiency rate is based on Dr. Carter's 2002 report. Additional literature review and analysis may be necessary to update. Table A1 does not include Nutrient Management (NRCS 590) because the efficiency of nutrient management is difficult to estimate due to numerous complexities such as the highly site-specific nature of the practice, and the dynamic and responsive nature of the practice (TFT, 2015). Nutrient management is most effective when used in conjunction with other on-field BMPs. Nutrient management is not assigned an efficiency rate, but is instead considered to be a complementary practice that enhances the outcomes of other BMPs when considered as part of a conservation plan.

For instruction son the application of SISL, see Appendix B.

Appendix B. SISL Method for Quantifying Total P Reductions

B1. SISL

The SISL model is an empirical model that was developed and calibrated by the NRCS using over 200 field-years of data from Southern Idaho. The form of the SISL model is similar to that of the Universal Soil Loss Equation (USLE). The model estimates the overall soil loss at the end of a furrow by multiplying a base soil loss value by other adjustment factors to reflect the on-field conditions. The accuracy of the SISL model was confirmed against instream water quality data collected by USGS for Mason Creek (TFT, 2015). The model takes the following form:

$$SISL = BSL \times KA \times PC \times CP \times IP$$

where:

- **Base soil loss (BSL)**: the base soil loss is a function of field slope, field length, crop type, and end of field slope shape (convex end). Embedded within the BSL is the typical irrigation practices (number of irrigations, inflow rate, furrow spacing, irrigation duration, etc.) used for the different crop categories in southern Idaho (Bjorneberg et al., 2007). Base soil loss values for a given field can be determined by locating the value from the below tables corresponding to the correct combination of the following variables: 1) surface irrigation method (gated pipe, siphon tube, or feeder ditch); 2) crop type (permanent cover, close growing, row crop, or intensive row crop); 3) field length (660 feet or 1320 feet); 4) field slope (<1%, 1 – 1.9%, 2 – 2.9%, or > 3%); and 5) end condition (no, moderate or severe convex ends). Examples of specific crops included in each of the four crop type categories are described below.

Crop Type	Field Length (ft)	Base Soil Loss (tons/acre) – Gated Pipe											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
		N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.7	0.9	1.3	2.4	3.0	4.3	5.9	7.4	10.3
	1320	0.0	0.0	0.0	0.6	0.7	1.0	1.9	2.4	3.4	4.7	5.9	8.2
Close growing	660	1.2	1.4	1.9	3.4	4.2	4.9	6.7	8.4	11.8	10.9	13.7	19.1
	1320	1.0	1.1	1.5	2.7	3.4	4.7	5.4	6.7	9.4	8.7	11.0	15.3
Row crop	660	2.6	3.3	4.6	9.1	11.4	16.1	19.3	24.2	32.2	29.4	36.8	51.5
	1320	2.1	2.6	3.7	7.3	9.1	12.9	15.4	19.4	25.8	23.5	29.4	41.2
Intensive row crop	660	3.4	4.2	5.9	12.7	16.0	22.3	27.7	34.7	48.5	46.2	57.8	80.9
	1320	2.7	3.4	4.7	10.2	12.8	17.8	22.2	27.8	38.8	37.0	46.2	64.7
* N, M and S refer to none, moderate and severe convex ends.													

Crop Type	Field Length (ft)	Base Soil Loss (tons/acre) – Siphon Tube											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
		N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.7	0.9	1.2	2.3	2.9	4.1	5.6	7.0	9.8
	1320	0.0	0.0	0.0	0.6	0.7	1.0	1.8	2.3	3.3	4.5	5.6	7.8
Close	660	1.1	1.3	1.8	3.2	4.0	5.6	6.4	8.0	11.2	10.4	13.0	18.2

growing	1320	0.9	1.0	1.4	2.6	3.2	4.5	5.1	6.4	9.0	8.3	10.4	14.6
Row crop	660	2.5	3.1	4.4	8.7	10.9	15.3	18.4	23.0	32.2	28.0	35.0	49.0
	1320	2.0	2.5	3.5	7.0	8.7	12.2	14.7	18.4	25.8	22.4	28.0	39.2
Intensive row crop	660	3.2	4.0	5.6	12.1	15.2	21.2	26.4	33.0	46.2	44.0	55.0	77.0
	1320	2.6	3.2	4.5	9.7	12.2	17.0	21.1	26.4	37.0	35.2	44.0	61.0
* N, M and S refer to none, moderate and severe convex ends													

		Base Soil Loss (tons/acre) – Feeder Ditch											
		Field Slope											
		<1%			1 to 1.9%			2 to 2.9%			>3%		
Crop Type	**Field Length (ft)**	N*	M	S	N	M	S	N	M	S	N	M	S
Permanent cover	660	0.0	0.0	0.0	0.8	1.0	1.4	2.6	3.3	4.7	6.4	8.1	11.3
	1320	0.0	0.0	0.0	0.6	0.8	1.1	2.1	2.6	3.4	5.1	6.5	9.0
Close growing	660	1.3	1.5	2.1	3.7	4.6	6.4	7.4	9.2	12.9	12.0	15.0	20.9
	1320	1.0	1.2	1.7	3.0	3.7	5.1	5.9	7.4	10.3	9.6	12.0	16.7
Row crop	660	2.9	3.6	5.1	10.0	12.5	17.6	21.2	26.5	32.2	32.2	40.3	56.4
	1320	2.3	2.9	4.1	8.0	10.0	14.1	17.0	21.2	25.8	25.8	32.2	45.1
Intensive row crop	660	3.7	4.6	6.4	13.9	17.5	24.4	30.4	38.0	53.1	50.6	63.3	88.6
	1320	3.0	3.7	5.1	11.1	14.0	19.5	24.3	30.4	42.5	40.5	50.6	70.9
* N, M and S refer to none, moderate and severe convex ends													

CROP TYPE	**Examples**
Permanent Cover	Alfalfa, clover/wildflowers, fallow/idle cropland, grapes, herbs, pasture/grass, pasture/hay
Close Growing	Barley, camelina, canola, flaxseed, hops, oats, rye, safflower, sorghum, sunflower, triticale, wheat
Row Crop	Carrots, corn, dry beans, greens, lettuce, mint, mustard, peas, pumpkins, soybeans, watermelons, peppers
Intensive Row Crop	Onions, potatoes, radishes, sugarbeets, turnips

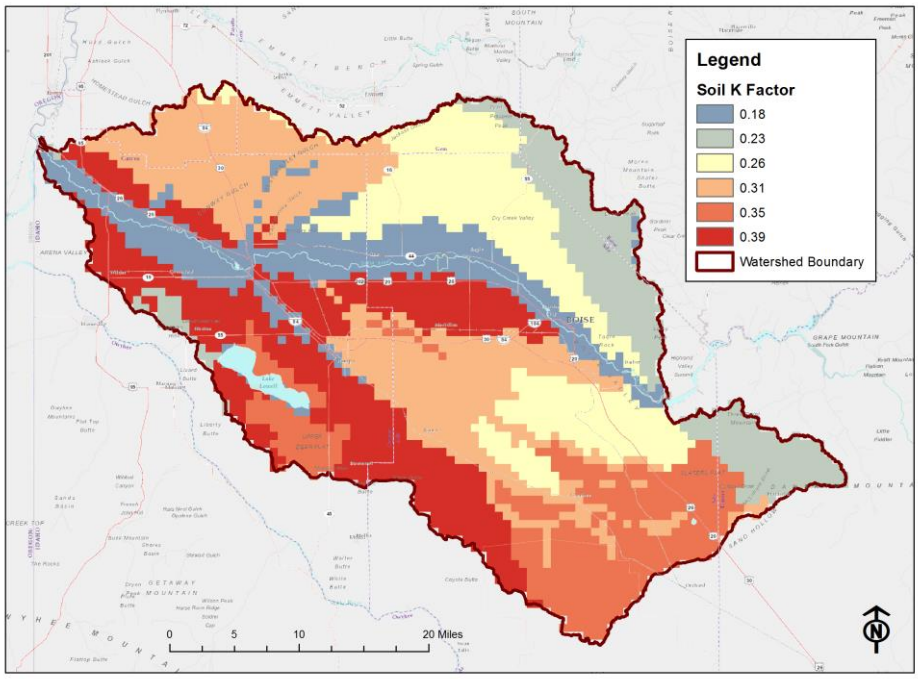
- **Soil erodibility adjustment factor (KA)**: The soil erodibility adjustment factor is based on the NRCS soil erosion "K" factor from USDA soil surveys. The dominant K factors in the Lower Boise River watershed can be found in Figure X below. Once the K factor is estimated based on the map below, this value is then multiplied by 2.04 to get the adjustment factor, KA, for use in the SISL equation.[28]

K Factor	**KA (after applying 2.04 multiplier)**
0.18	0.37
0.23	0.47
0.26	0.53
0.31	0.63
0.35	0.71
0.39	0.80

Regarding the K-Factor Guides. This table represents the easiest way for someone to estimate the dominant K factor for their field. There are higher resolution maps of K

[28] The soil erodibility adjustment factor (KA) is based on the soil erosion factor (K factor) from NRCS soil surveys. The KA factor used in the SISL model is the NRCS K factor for the modeled soils, multiplied by 2.04 (NRCS, 2003).

factors with much smaller pixels, but these would be unwieldy for estimating the dominant K factor for a given field. Instead, TFT looked at the distribution of K factors in the watershed and split it into 6 clumps. The K factors in the map are essentially the average K factor for those clumps. This approach loses some resolution but gains a lot of usability.



- **Prior crop adjustment factor (PC)**: The SISL model includes a prior crop adjustment factor (PC) to account for crop residue from the previous year's crop. High residue crops provide additional resistance to soil erosion.[29]

CROP	PC ADJUSTMENT FACTOR
Pasture	0.65
Alfalfa	0.70
Mint	0.70
Alfalfa Seed	0.75
Small Grain (high residue)	0.75
Corn (high residue)	0.75
Corn silage	0.85
Sugar Beets	1.00
Potatoes	1.00

*PC adjustment factors derived from NRCS 2003 data[30]

[29] USDA crop data (USDA, 2005 and 2007-2014) were used to determine the crop type in the previous year, which informed the selection of the PC adjustment factor for that year.

[30] Need reference from TFT

- **Conservation practice adjustment factor (CP)**: Any variation of conservation practices can be altered through the CP adjustment factor.[31]

CONSERVATION PRACTICE	CP ADJUSTMENT FACTOR*
No conservation practices installed	1.00
Conventional/moldboard tillage	1.00
Residue management (seasonal)	0.20
Residue management (mulch till)	0.15
Residue management (no till)	0.10
Deep tillage	0.50
Alfalfa seed	0.35
Alfalfa hay (more than one year in rotation)	0.20

*CP adjustment factors derived from NRCS 2003 data[32]

- **Irrigation management adjustment factor (IP)**: Typical surface irrigation practices are reflected in the irrigation management adjustment factor (NRCS, 2003). The factor applicable to a particular field will vary depending on the type of irrigation practices being used.

IRRIGATION MANAGEMENT TYPE[33, 34]	IP ADJUSTMENT FACTOR
No irrigation management occurring	1.00
High level irrigation water management w/o cutback	0.90
High level irrigation water management with cutback	0.70
Surge irrigation	0.50

B2. Sediment Loss to Total Phosphorus Conversion Factor

The SISL model calculates the total soil loss currently associated with surface irrigation practices at the relevant field. For every ton of sediment loss modeled at a field, DEQ assumes that two (2) pounds of total phosphorus are attached (IDEQ, 2010; TFT, 2015). Therefore, in calculating total phosphorus credits, multiply the number of tons of soil

[31] Because no information is available to suggest if additional conservation practices are being implemented at any particular field, this Framework should assume that only conventional tillage is being implemented. However, if conservation practice(s) are being implemented, then the appropriate conservation practice adjustment factor should be used.

[32] Need reference from TFT

[33] "High level irrigation water management" is a combination of a variety of irrigation methods and technologies used to improve water application efficiency. Additional information can be found at http://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd323426&ext=pdf.

[34] "Cutback" is the reduction of furrow inflow after the flow has reached the end of the furrow. Surge flow and cablegation are examples of cutback systems.

loss from a field (e.g., 1.5 tons, not 3000 pounds) by two to translate from sediment loss to attached total phosphorus.

TAC Reviewers: Assumptions of the SISL model are based on field sampling and literature review research completed by Dr. D.L. Carter and David Ferguson of the Idaho Soil Conservation Commission in support of the original Lower Boise River Trading Framework.

Ferguson, D.F. 2000a. Estimating an agricultural surface irrigated Cropland sediment and phosphorus loss with average surface irrigation soil loss. Unpublished Technical Report, Idaho Soil Conservation Commission.

Ferguson, D.F. 2000b. Watershed scale and field scale sediment basin phosphorus reduction effectiveness. Unpublished Technical Report, Idaho Soil Conservation Commission.

Carter, D.L. 2002. Proposed Best Management Practices (BMP's) to be Applied in the Lower Boise River Effluent Trading Demonstration Project. Unpublished Technical Report, Idaho Department of Environmental Quality.

B3. BMP Efficiency Rates

Assuming an approved BMP is designed, implemented, monitored, maintained, and tracked according to the quality standards outlined in Appendix C, then the total phosphorus reduction potential associated with the field—SISL output in tons soil loss, multiplied by two—is then adjusted by the appropriate "BMP efficiency rate" (see Table 4.1, from TFT, 2015). BMP efficiency rates are not discounted for each field. Instead of discounting BMP efficiency rates to address uncertainty and multiplying the overall obligation for a credit buyer by a 2:1 to account for uncertainty (see Section 4.3 of this Framework), uncertainty is only applied to the credit buyer obligation.

B4. BMP Efficiency Rates Where Multiple BMPs are Installed

Table A1 above lists the approved BMP efficiency rates for individual BMPs. If multiple BMPs are installed at a field, then the individual BMP efficiency rates must be discounted to account for redundancy associated with simultaneous application of the two practices. Discount rates were developed acknowledging that phosphorus runoff is likely reduced by implementing multiple BMPs, while reflecting the diminishing returns that are likely to be seen with the employment of each additional BMP.

There are two types of "multiple BMP discount factors." Where the BMPs do not overlap spatially and may interact relatively independently (e.g., cover crop installed on upland and sediment basin installed on edge of field), the BMP efficiency rate of the less efficient BMP is discounted by 11% (TFT, 2015). Where the BMPs are spatially

overlapping and therefore are more likely to interact (e.g., conservation tillage and cover crops both help to reduce sediment loss on a field by maintaining vegetative cover on the soil surface), the BMP efficiency rate of the less efficient BMP is discounted by 20% (TFT, 2015).

The equations below describe how these discount rates are applied in the calculation of the overall efficiency rate associated with multiple BMPs:

- Equation 1a: Non-overlapping BMPs[35]

  $E_{1+2} = E_1 + 0.89E_2(1 - E_1)$

  Where,

  E_{1+2} = Combined Efficiency of BMPs #1 and #2
  E_1 = Efficiency rate of BMP #1 (the more efficient of the two BMPs)
  E_2 = Efficiency rate of BMP #2

- Equation 1b: Overlapping BMPs[36]

  $E_{1+2} = E_1 + 0.8E_2(1 - E_1)$

  Where,

  E_{1+2} = Combined efficiency of BMPs #1 and #2
  E_1 = Efficiency rate of BMP #1 (the more efficient of the two BMPs)
  E_2 = Efficiency E_{1+2} rate of BMP #2

The effectiveness of additional BMPs can be calculated using the same equation structure. For example, if a third BMP is added, the results from Equations 1a or 1b would be used as follows:

Equation 2a or 2b:

$E_{1+2+3} = E_{1+2} + (\text{discount})E_3(1 - E_1)$

Where,

E_{1+2+3} = Combined Efficiency of BMPs #1, #2 and #3
E_{1+2} = answer from equation 1a or 1b
Discount = either 0.11 or 0.2, depends whether E_3 is overlapping or not
E_3 = Efficiency rate of BMP #3

[35] Non-overlapping BMPs are pairs of BMPs that are function in discrete physical locations, and/or employ different mechanisms to reduce soil erosion, such as irrigation upgrades (on-field, decreases disruptive force of water application) and filter strips (edge-of-field, creates physical barrier for moving water and sediment).

[36] Physically overlapping BMP pairs are those that include any combination of the following: cover crop, strip or no-till, sprinkler upgrade, microirrigation upgrade, surge irrigation, or straw in furrows.

Appendix C. BMP Quality Standards

The 2010 Lower Boise Trading Framework includes a set of abbreviated BMP quality standards for each of the BMPs. Based on lessons learned through the Joint Regional Recommendations process, these quality standards will be updated, approved by DEQ, and added to this appendix.